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TITLE Implementation for streaming **SOAP** message with Web Services **security**
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ATTYRATE 3 20030212 Kazuo I Kondoh/Japan/IBM
DIVISION TRL
DESCRIPT (Field of the invention)
The present invention relates to processing of a data file, more specifically to processing of an XML document such as a **SOAP** message used in web service.
(Object)

==> (DOSS)
1:SRC 2:SEL 3:BRW 4=DSP ALL 5=XPLN 6=LIST 7=DOC-1 8=DOC+1 10=P-1 11=P* 12=CPY

To provide a technique for sending/receiving a **SOAP** message with a little burden on a processing capability or memory of a client and to implement a web service system appropriate for using a terminal device with such a limited capability as a client.

(Solution)

The present invention creates a **SOAP** message without using DOM by generating a body part by sequentially performing such a process of a message as encryption or signing for each piece of the message, generating a **header** part by using information acquired during the process, and by combining the body part and the **header** part. The present invention also breaks a **SOAP** message without using DOM by acquiring **header** information with parsing a received **SOAP** message and sequentially performing decryption or verification of a signature of a body part according to the **header** information.

(Advantages of the Invention)

As mentioned above, the present invention provides a technique for sending/receiving a **SOAP** message with a little burden on a processing capability or memory of a client and implements a web service system appropriate for using a terminal device with such a limited capability as a client.

The present invention also provides a method for processing a body part, which is performed according to a definition described in a **header** part, in a streaming process for a document file including a **header** part and a body part.

Kazuo I Kondoh/Japan/IBM 19-Aug-2003

CLAIMS CLAIMS AT FILING: Claims for docket JP920030034JP1

(1) A method for creating a **SOAP** message characterized by comprising:
a first step of reading out a message body from predetermined storing means predetermined piece by piece
a second step of generating a body part of a message by sequentially performing a process on read out said pieces and holding the body part in a work area in predetermined storing means, and at the same time, acquiring information on the process
a third step of generating a **header** part of a message including acquired said information on the process and holding the **header** part in a work area of predetermined storing means and
a forth step of composing a **SOAP (Simple Object Access** Protocol) message by reading out said body part and said **header** part from the work area of said storing means and combining said parts.

(2) The method for creating a **SOAP** message according to Claim 1,

characterized by sequentially encrypting pieces of said message and acquiring a reference ID for referring to an encrypted part in said body part and information on a way of encryption in said second step.

(3) The method for creating a **SOAP** message according to Claim 1, characterized by signing a piece of said message of a processing object and acquiring a reference ID for referring to a signed part in said body part and information on a way of signing in said second step.

(4) The method for creating a **SOAP** message according to Claim 1, characterized by performing a number of processes on a piece of said message and acquiring information on each process in said second step.

(5) A method for processing a **SOAP** message characterized by comprising:

a first step of extracting information on a process of a body part from a **header** part of a **SOAP (Simple Object Access** Protocol) message and storing the information into a work area of predetermined storing means, while parsing the **SOAP** message and

a second step of sequentially processing a predetermined part of said body part according to information stored in the work area of said

storing means, while parsing said **SOAP** message.

(6) The method for processing a **SOAP** message according to Claim 5, characterized by

extracting decryption information including an encrypted part of said body part and a way of decryption in said first step and

decrypting a part of said body part specified by extracted said decryption information according to the decryption information in said second step.

(7) The method for processing a **SOAP** message according to Claim 5, characterized by

extracting verification information including a signed part of said body part and a way of signing in said first step and

verifying said signature for a part of said body part specified by extracted said verification information in said second step.

(8) The method for processing a **SOAP** message according to Claim 5, characterized by parsing said predetermined part processed by said second step in said body part by using an independent parser, and recursively performing said first and second steps.

(9) The method for processing a **SOAP** message according to Claim 8, characterized in that said second step comprises the steps of:

creating said independent parser in starting a process of said predetermined part of said body part
processing said predetermined part and
parsing processed said predetermined part by using said independent parser.

(10) A method for processing data for processing a data file conforming to a specification of description for including a **header** part and a body part with a processing object of a predetermined process being set in the body part and information on the process and information specifying the processing object being described in the **header** part, characterized by comprising:
a first step of reading out an original data predetermined piece by piece from a predetermined storing means storing the original data of said data file
a second step of generating a body part of said data file by performing a process on said read out piece in a streaming process and holding the body part in a work area of predetermined storing means, and at the same time, acquiring information on the process
a third step of generating a **header** part of said data file including information on acquired said process and holding the **header** part in a

work area of predetermined storing means and
a fourth step of composing said data file by reading out said body part and **header** part from the work area of said storing means and combining said parts.

(11) A method for processing data for processing a data file conforming to a specification of description for including a **header** part and a body part with a processing object of a predetermined process being set in the body part and information on the process and information specifying the processing object being described in the **header** part, characterized by comprising:
a first step of extracting information on a process of a body part from a **header** part of the data file and storing the information into a work area of predetermined storing means, while parsing said data file by a first parser and
a second step of processing a predetermined part of said body part in a streaming process according to information stored in the work area of said storing means, while parsing said data file by said first parser,
wherein said second step comprising the steps of:
creating a second parser independent of said first parser in starting

a process of said predetermined part of said body
processing said predetermined part and
parsing processed said predetermined part by using said second parser.

(12) An information processing apparatus characterized by comprising:
a processing unit for performing a predetermined process on a body part of a **SOAP (Simple Object Access** Protocol) message, and at the same time, acquiring information on the process
a message composing-control unit for reading in said **SOAP** message predetermined piece by piece and passing the predetermined piece of said message to said processing unit on the basis of setting for the process of said message determined previously
a **header** generating unit for generating a **header** part of said **SOAP** message including information on said process acquired by said processing unit and
a message composing unit for composing a **SOAP** message by combining a body part processed by said processing unit and a **header** part generated by said **header** generating unit.

(13) The information processing apparatus according to Claim 12, characterized in that said processing unit sequentially encrypts

pieces of said message and acquires a reference ID for referring to an encrypted part in said body part and information on a way of encryption.

(14) The information processing apparatus according to Claim 12, characterized in that said processing unit signs a piece of said message of a processing object and acquires a reference ID for referring to a signed part of said body part and information on a way of signing.

(15) An information processing apparatus characterized by comprising:
a breaking-control unit for detecting a **header** part and a body part by parsing a **SOAP (Simple Object Access** Protocol) message and further detecting a processing object in the body part
a **header-processing** unit for extracting information on a process of said body part from said **header** part detected by said breaking-control unit and
a processing unit for performing a process on said processing object in said body part according to information extracted by said **header-processing** unit,
wherein said breaking-control unit parses said **SOAP** message from the top in order, passes detected said **header** part to said

header-processing unit, and also passes said processing object in detected said body part to said processing unit,
and wherein said **header-processing** unit and said processing unit sequentially process a part of said **SOAP** message received form said breaking-control unit.

(16) The information processing apparatus according to Claim 15, characterized in that said processing unit creates a parser independent of that of said breaking-control unit in starting a process on said processing object of said body part and further parses the processed processing object by using the independent parser.

(17) The information processing apparatus according to Claim 16, characterized in that
said **header-processing** unit extracts decryption information including an encrypted part of said body part and a way of decryption, and said processing unit performs a decryption process on a part of said body part specified in said decryption information extracted by said **header-processing** unit according to the decryption information.

(18) The information processing apparatus according to Claim 15, characterized in that

said **header-processing** unit extracts verification information including a signed part of said body part, a way of signing and a signature value, and at the same time, verifies a signature by using the signature value,

said processing unit verifies a signature by using a digest value calculated on the basis of said verification information for a part of said body part specified in extracted said verification information.

(19) A program for processing data by controlling a computer, characterized in that said program causes said computer to execute:

a first process of reading out an original data predetermined piece by piece from predetermined storing means storing original data of a data file conforming to a specification of description for including a **header** part and a body part with a processing object of a predetermined process being set in the body part and information on the process and information specifying the processing object being described in the **header** part

a second process of generating a body part of said data file by processing read out said pieces in a streaming process and holding the body part in a work area of predetermined storing means, and at

the same time, acquiring information on the process
a third process of generating a **header** part of said data file including acquired said information on process and holding the **header** part in a work area of predetermined storing means and
a fourth process of composing said data file by reading out said body part and said **header** part from the work area of said storing means and combining the parts.
(20) The program according to Claim 19, characterized in that said data file of a processing object is a **SOAP (Simple Object Access** Protocol) message.
(21) A program for processing data by controlling a computer, characterized in that said program causes said computer to execute:
a first process of, while parsing a data file conforming to a specification of description for including a **header** part and a body part with a processing object of a predetermined process being set in the body part and information on the process and information specifying the processing object being described in the **header** part by a first parser, extracting information on a process of a body part from a **header** part of the data file and storing the information into a work area of predetermined storing means

a second process of creating a second parser independent of said first parser
a second process of, while parsing said data file by said first parser, processing a predetermined part of said body part in a streaming process according to information stored in a work area of said storing means and
a step of parsing a processed said predetermined part by using said second parser.
(22) A recording medium recording a program described in any of Claims 19 to 21 in a computer readable manner.
Kazuo I Kondoh/Japan/IBM 19-Aug-2003

IBMUSE At this time, no plan yet but in future, this tech. may be used in Web application product, for example WebSphear etc.
Kazuo I Kondoh/Japan/IBM 19-Aug-2003

RELATED none
Kazuo I Kondoh/Japan/IBM 19-Aug-2003

USEBYOTH Web Application software company or internet provider, may be.
Kazuo I Kondoh/Japan/IBM 19-Aug-2003

DISCOVER Difficult; e.g.; with reverse engineering or examination of available code

From disclosure JP8-2002-1274 at time of final decision 13-Feb-2003

PRIORART (Non-Patent Document 1)
Bob Atkinson et al., "Web Services **Security** (WS-Security)", (online), May 23, 2002, (searched on February 27, 2003), Internet<http:www.microsoft.com/japan/msdn/webservices/spec/ws-security.asp>
Kazuo I Kondoh/Japan/IBM 19-Aug-2003

DIVULGAT No
From disclosure JP8-2002-1274 at time of final decision 13-Feb-2003
All comments above have been modified by Kazuo I Kondoh/Japan/IBM 19-Aug-2003

R0601 * END OF DOCUMENTS IN LIST - ENTER RETURN OR ANOTHER COMMAND.

==> (DOSS)
1:SRC 2:SEL 3:BRW 4=DSP ALL 5=XPLN 6=LIST 7=DOC-1 8=DOC+1 10=P-1 11=P* 12=CPY